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Edward L. Bandy, Flight Instructor
Mansfield, Texas 76063

Reference, Tecnam Sierra N145AG aircraft accident on 1/23/2010

I first flew 145AG on January 20, 2010 as the CRP Future Pilots flight school had received the aircraft the day before. Prior to that I had about 70 hours in Tecnam Sierra N219TS and 30 hours in Tecnam Sierra N143AG. Having about 100 hours in the Tecnam Sierra, I saw no reason to test fly the aircraft prior to taking a flight student up for a lesson.

I also have about 950 total time in Light Sport Aircraft of which about 200 are in a Sport Cruiser which also has the Rotax 912ULS. My total time is 1600, with Instrument, Commercial and Sport CFI. I also have time in Light Sport Aircraft such as the IndUS Thorpedo 600 hours with a Jabiru 3300 or 2200 engines, Zenith Zodiac HD 10 hours with a Continental O-200. Other time is in Ercoups, Cessnas, Pipers and Diamonds.

N145AG flew generally as well as the other two Tecnam Sierras that I have flown except that she seemed to be just a tiny bit lethargic in climb although instrumentation indicated that this feeling was unjustified. Regarding stalls, 145AG would always drop the left wing, never the right wing. The drop was similar to Tecnam Sierra 219TS and was very manageable with a little right stick and right rudder during the power addition and nose down attitude recovery procedure. I typically began stalls at 3000MSL to 3500MSL with typical elevation in the practice area in the 500 foot range. This put me at 2500AGL to 3000AGL with most stalls being recovered easily in 50 feet of altitude loss. For power off stall entry I teach my students to establish level flight with level trim, then at level flight, extend full flaps, hold level attitude down to 40kts with power reduced to idle, then at 40kts, bring the nose of the aircraft to just above the horizon. I would estimate this to be about 10 to 12 degrees however without an Attitude Indicator in 210TS it was difficult to determine accurately. (I am conservative in teaching power off stalls nose up attitude to students who are early in their training and become more aggressive in the later stages of training.) 145AG had the Advanced Systems which I could have looked at for attitude but preferred to be visually outside the airplane during stalls. I do not allow students to let the left wing drop more than a few degrees before I get involved in the recovery effort, perhaps as few as 10 degrees of wing down if I don't see control inputs initiating recovery from the stall and that bank attitude. I have never spun a Tecnam Sierra. I have had spin training in a Cessna Aerobat. With flaps extended fully, the time from 40kts as we bring the nose up to initiate the stall is about four to five seconds at most. This time includes the time that we are bringing the nose up. 145AG did not tend to drop the left wing during stall entry, only after the stall. Without the nose coming up far enough the Tecnam Sierra will begin a bucking descent without a crisp, pronounced stall occurring. During this noticeable bucking type descent/stall, both 219TS and 145AG would begin to drop the left wing. The bank angle can be easily controlled during this type of stall.

During the days prior to the accident when with students, I believe that we flew 145AG topped off and I was unaware of any noticeable differences in performance in stall recovery compared to less than full fuel.

In order to induce a power off stall properly, the stick needs to be pulled well back. I would say the total distance the control stick can be moved from center to full aft is about eight inches, but I will measure this later if needed. To induce a crisp stall, the control stick needs to be moved aft about 3/4ths of the control sticks available aft space from neutral when entering a stall from 40kts at level attitude.

Control forces required for stall entry are not great and recovery forces required are minimal. So minimal, that I put my hands in front of the control stick so a student cannot push the nose down too far. The distance the control stick must be moved forward to break the stall is minimal, only an inch or two and requires minimal muscle power, almost just thinking about it will get the nose down properly typically.

During my second flight on Thursday, January 21, 2010 with student Jim Hughes, we did go very high into the nose up attitude in my demonstration of a power on stall. The power on stall in a Tecnam Sierra is done at about 3200RPM, otherwise the nose can exceed 30 degrees of nose up attitude at full power. We were at that high nose up attitude with power for about 20 seconds and had no problem with the flight controls being responsive.

Prior to any flight, during the run up phase, I am very aggressive in the item on the checklist, "controls free and correct". I knew one of the two persons killed at the 2008 Sebring LSA fly in who were killed when after taking off in a Remos, they discovered their ailerons were not operational. The Remos has folding wings and the ailerons had not been reconnected when the wings were extended. This is my motivation for aggressive movement of the control stick about the cockpit before takeoff. I do this on every flight without exception. My point being that 145AG indicated no control stick issues on any flight I took with that aircraft. Since the Tecnam Sierra has nose wheel steering, any impediment of actuation of the rudder/steering system would have been obvious during taxi out. At RBD, several fairly tight turns are required to get from the ramp to the takeoff point. I think that Greg would have noticed this or even Eric would have since he had flown other Tecnam Sierras before.

Had I any reservations about 145AG, I would not have flown her past any point where I thought something even slightly wrong with the flight controls. After having been a production test pilot for IndUS Aviation that manufactures the LSA Thorpdeo, I am a very cautious pilot as I have had many things go wrong and understand fully how a seemingly minor squawk can indicate a very major problem and must be taken very seriously. My opinion is that prior to the accident, the flashlight was in no way causing a problem. The thought that Greg and Eric taxied out, flew through the takeoff and to the practice area, then initiated stalls leads me to believe that neither person observed any control issue.

In speaking after the crash, with my adult student Anders Heintz who flew with me on the windy, Friday 22, he mentioned to me that he remembered me saying during landing, "I don't think the rudder was working". I do not remember saying that to him as if the rudder was not working, I would have been much more aware of that and certainly much more excited about that. I certainly would not have flown 145AG the following morning with Crysta Williams if I thought the rudder was non operational. I think what I said to

him was probably something about how little rudder I had to work the rudder in landing in high winds that were off runway about 20 degrees. Wind on that Friday was 14 gusting 26 at 150 degrees and we used runway 17, although the wind seemed far less than what the AWOS provided. Anders and I flew once around the RBD pattern and determined that winds aloft were too great for flight training.

In summary, I don't think that the controls were impeded prior to the flashlight moving into place where it finally jammed the controls. I don't think that Greg would have continued into the flight had he sensed any control issue. I think that Eric would have mentioned any control issue to Greg, as Eric had flown the airplane enough to recognize any issue. The control impedance from the tail cone would have effected and been noticed in both sets of controls in the cockpit.

Obviously, depending on how much data the Advanced Systems flight recording capability is, a determination can be made of how much nose up attitude I flew with my students the days before versus how much attitude Greg/Eric used to induce their stall. Perhaps this will offer insight into how the flashlight moved into place. If their stall entry was steeper in pitch than my power off or power on stalls, that might explain something about at what point the flashlight entered into its final position, but I don't know if the Advanced System records only engine instrumentation or includes flight instruments as well.

Regarding N145AG I flew the following times prior to the accident...

Wednesday, January 20, 2010 1.3 hours with CRP student Aiesha Steward in general maneuvers, not including stalls. 2x landings.

Thursday, January 21, 2010 1.4 with adult student Jim Hughes in a general orientation flight, including power on and power off stalls. 5x landings.

Again on Thursday, January 21, 2010 1.5 with CRP student Aiesha Steward, all types of maneuvers including full power climbs, turning climbs, power reduced turns, engine out practice procedures, slow flight and a series of about 25 power off stalls. 3x landings.

Friday, January 22, 2010, 0.4 with adult student Anders Heintz. We just flew once around the pattern at RBD as wind was close to being too much. We determined that although the wind was manageable, the wind was too high for good for instruction. 1x landing.

Saturday, January 23, 2010 0.7 with CRP student Crysta Williams, around the traffic pattern at RBD. 4x landings.

Regarding N145AG flight characteristics I noted these items.

1. The airspeed indicator did not come alive until 40 kts. At that point, prior to rotation it came alive and worked perfectly. I had been advised of this prior to flight as the aircraft had received maintenance because a bee had gone into the pitot tube on a prior date. I did not note if the airspeed was indicated on the Advanced Flight Systems display so I don't know if it was operational during takeoff. My plan was to use the round gage airspeed indicator and it came alive each time at 40kts.
2. On a touch and go sequence on the first flight in the aircraft, 1/20/10, I added power after a touch down but before I pushed carb heat in. The aircraft ran very roughly and would only make about 3500RPM. I aborted the takeoff and taxied back to the ramp where I was informed that carb heat must be pushed in prior to adding power. With carb heat pushed in the engine ran perfectly at full power during the next touch and go's.
3. During the flight of 1/20/10 with Aiesha Steward, during cruise flight, I noted or believed I perceived a very, very minor engine "bump" sort of like a minor miss, sound at 4800RPM. The "bump" was so minor that I was unsure if I was actually hearing it. I flew level for about a minute as PIC just to determine if it was my imagination or if there was an issue. I asked CRP student Aiesha Steward, 16 year old girl, if she noted the "bump" and she said she did, although I am not sure if she actually did, given her very low time and familiarization with internal combustion engines. I was unable to observe or feel the "bump" during this brief evaluation segment of flight and continued the lesson. This "bump" was not noted on any of the subsequent flights. During my flight career, I have had five engine issues with several types of engines, where a landing was required as soon as possible. This includes in flight issues such as valve lifter rods sticking in the guides, spark plug wires coming off, fuel filter congestion and a split oil line. Sometimes, I think these experiences may lead me to be over sensitive to engine sounds and smells.
4. The stall characteristic of N145AG was to drop the left wing consistently. The airplane never stalled straight ahead. The predictable left wing drop was almost identical to the stall characteristics of the other CRP Tecnam Sierra N219TS. As a result, I told the student Aiesha Steward, "do not let the aircraft drop the left wing during the stalls". I reinforced this heavily as I did not want to spin the airplane. We were at 3500MSL during this practice. The left wing drop is easily controlled with full power, a nose down, right stick, right rudder correction. The stall with left wing drop, was very similar to a Zenith Zodiac HD that I had given instruction in. After the flight of 1/21/10, I phoned the Tecnam Sierra dealer,

Justin Shelly to ask if dropping the left wing was common to Tecnam Sierra aircraft. Mr. Shelly told me he was unaware of this being a flight characteristic of the Tecnam Sierra. I also asked if the aircraft could be out of rig. After I hung up with Mr. Shelly, I called the Tecnam office in Florida to ask a similar series of questions. I was referred to Mr. Tim Brock but learned he was in Sebring, Florida at the Sebring Fly In. The left wing dropping issue was minor enough that I only asked his office to have him call me upon his return. Subsequently, after the N145AG accident, when Mr. Brock was at DFW airport, I was able to speak with him by phone and he told me how to have a mechanic adjust the "stall strips" to keep the wing from dropping.

5. The starboard side canopy latch would not engage as it was bent.
6. During the first few flights of 145AG, although we were generating 4800 to 5000RPM on take off which is normal, N145AG just did not seem to climb as well as N219TS. Indications of climb rate, airspeed, RPM and other instrumented factors were nominal. Even my CRP student Aiesha Steward noted the same feeling. She mentioned on several occasions that she liked N219TS, "I just like the other airplane better". I even called the aircraft dealer, US Aviation in Denton to ask if N145AG had a different prop, perhaps a climb prop. The rep, Justin Shelly, said the props were the same.

Other than the notes above, N145AG preformed beautifully.

Regarding my reasons for going to and my actions at the crash scene, I thought it would be important to have someone from CRP actually go to the scene for a first hand look. My background in law enforcement as a Police Officer led me to believe this would be important. Upon arriving at the scene, I met Mr. Kevin Taylor FAA representative. Mr. Taylor asked if I could help him obtain a fuel sample. I agreed and we went to the aircraft. I noted the leading edges of the wings were crushed and believe the fuel tanks would have been empty as the fuel tanks are in the leading edges of the wings, near the wing root. The fuel tank caps looked to be crushed into place with some of the sheet metal bent up onto the edge of the caps. I assured Mr. Taylor that the aircraft had fuel and that fuel contamination should not be an issue as I had just flown the aircraft earlier that day. During my preflight on 1/23/2010 the fuel tanks were fully topped off and even had some fuel coming out of the starboard wing tank vent which is on the wing tip, to show the tank full and vent open. The smell of fuel was heavy in the air at the accident site. I did not touch any components during my approximately 5 minutes inside the yellow taped area at the crash site with Mr. Taylor.

You may reach me at any of the contact points listed at the top of this document if you have additional questions. Thank you for your work in this investigation.